

What is claimed is:

Sub B1
1. ~~A semiconductor device in which a plurality of~~
5 semiconductor elements are formed on a substrate, wherein
in some or all of said semiconductor elements, a channel
width of a channel region formed in a semiconductor layer to
which laser annealing is applied is larger than a channel
length thereof, and a channel width direction is formed in a
10 direction different from a side direction of said substrate.

Sub D1
2. The semiconductor device according to claim 1 wherein
said laser annealing is performed to poly-crystallize an
amorphous semiconductor layer and obtain a polycrystalline
15 semiconductor layer.

Sub B2
3. ~~A semiconductor device in which a plurality of~~
semiconductor elements are formed on a substrate, wherein
in some or all of said semiconductor elements, a channel
20 width of a channel region formed in a semiconductor layer to
which laser annealing is applied is larger than a channel
length thereof, and a channel width direction is formed in a
direction different from a major-axis direction and/or a
minor-axis direction of a laser-beam irradiated region at the
25 time of application of said laser annealing.

Sub D1
The semiconductor device according to claim 3 wherein
said laser annealing is performed to poly-crystallize an

amorphous semiconductor layer and obtain a polycrystalline semiconductor layer.

- Sub 03
5. A display device comprising,
- 5 a plurality of pixel electrodes arranged on a substrate;
- a plurality of first thin-film transistors connected to corresponding pixel electrodes among said plurality of pixel electrodes for supplying signals for operating pixels to the connected pixel electrodes; and
- 10 a plurality of second thin-film transistors constituting a scanning drive circuit for scanning said plurality of first thin-film transistors and/or a display drive circuit for supplying display signals to said plurality of first thin-film transistors, wherein
- 15 in some or all of said plurality of second thin-film transistors, a channel width of a channel region formed in a semiconductor film to which laser annealing is applied is larger than a channel length thereof, and a channel width direction is formed in a direction different from a side
- 20 direction of said substrate.

- Sub D1
6. The display device according to claim 5 wherein
- among said plurality of second thin-film transistors, said some or all of second thin-film transistors in which the
- 25 channel width is larger than the channel length and the channel width direction is formed in a direction different from the side direction of said substrate
- are used, in said display drive circuit, as sampling

transistors for sampling video signals at a predetermined timing and supplying said display signals to the corresponding plurality of first thin-film transistors.

5 7. The display device according to claim 5 wherein said display drive circuit comprises:

10 a video signal line to which the video signals are supplied from outside, sampling transistors for sampling the video signals from said video signal line at a predetermined timing and supplying said display signals to the corresponding plurality of first thin-film transistors, and a shift register for controlling switching operation of said sampling transistors,

15 and wherein, among said plurality of second thin-film transistors, said some or all of second thin-film transistors in which the channel width is larger than the channel length and the channel width direction is formed in a direction different from a side direction of said substrate are used in said sampling transistors and the shift register.

20 8. The display device according to claim 5 wherein said laser annealing is performed to poly-crystallize an amorphous semiconductor film and obtain a polycrystalline semiconductor film.

25 *sub B4* 9. ~~The display device according to claim 5 wherein said channel width direction of said some or all of second thin-film transistors is set to a direction of about~~

45° ~~relative to any one or all of a plurality of side~~
directions of said substrate.

10. A display device comprising,

5 a plurality of pixel electrodes arranged on a substrate;
a plurality of first thin-film transistors connected to
corresponding pixel electrodes among said plurality of pixel
electrodes for supplying signals for operating pixels to the
connected pixel electrodes; and

10 a plurality of second thin-film transistors constituting
a scanning drive circuit for scanning said plurality of first
thin-film transistors and/or a display drive circuit for
supplying display signals to said plurality of first thin-film
transistors, wherein

15 in some or all of said plurality of second thin-film
transistors, a channel width of a channel region formed in a
semiconductor film to which laser annealing is applied is
larger than a channel length thereof, and a channel width
direction is formed in a direction different from a major-axis
20 direction and/or a minor-axis direction of a laser-beam
irradiated region at the time of application of said laser
annealing.

Sub D1 11. The display device according to claim 10 wherein

25 among said plurality of second thin-film transistors,
said some or all of second thin-film transistors in which the
channel width is larger than the channel length and the
channel width direction is formed in a direction different

from the major-axis direction and/or the minor-axis direction of said laser-beam irradiated region

are used, in said display drive circuit, as sampling transistors for sampling video signals at a predetermined timing and supplying said display signals to the corresponding plurality of first thin-film transistors.

12. The display device according to claim 10 wherein said display drive circuit comprises:

a video signal line to which the video signals are supplied from outside, sampling transistors for sampling the video signals from said video signal line at a predetermined timing and supplying said display signals to the corresponding plurality of first thin-film transistors, and a shift register for controlling switching operation of said sampling transistors,

and wherein, among said plurality of second thin-film transistors, said some or all of second thin-film transistors in which the channel width is larger than the channel length and the channel width direction is formed in a direction different from the major-axis direction and/or the minor-axis direction of said laser-beam irradiated region are used in said sampling transistors and the shift register.

13. The display device according to claim 10 wherein said laser annealing is performed to poly-crystallize an amorphous semiconductor film and obtain a polycrystalline semiconductor film.

Sub B5
14. ~~The display device according to claim 10 wherein
said channel width direction of said some or all of
second thin-film transistors is set to a direction of about
5 45° relative to the major-axis direction and/or the minor-axis
direction of said laser-beam irradiated region.~~

Sub D1
15. A liquid crystal display device comprising,
a plurality of pixel electrodes arranged on one of a
10 pair of substrates holding a liquid crystal therebetween;
a plurality of first thin-film transistors connected to
corresponding pixel electrodes among said plurality of pixel
electrodes for supplying signals for operating the liquid
crystal to the connected pixel electrodes; and
15 a plurality of second thin-film transistors constituting
a scanning drive circuit for scanning said plurality of first
thin-film transistors and/or a display drive circuit for
supplying display signals to said plurality of first thin-film
transistors,
20 channel regions of said plurality of first and second
thin-film transistors being formed in a semiconductor film to
which laser annealing is applied, and
in some or all of said plurality of second thin-film
transistors, a channel width being larger than a channel
25 length, and a channel width direction of some or all of second
thin-film transistors being formed non-parallel with and non-
orthogonal to a channel width direction of said first thin-
film transistors.

16. The liquid crystal display device according to claim 15 wherein

among said plurality of second thin-film transistors,
5 in said some or all of second thin-film transistors in which the channel width direction is formed non-parallel with and non-orthogonal to the channel width direction of said first thin-film transistors,

the channel width direction is further formed in a
10 direction different from a side direction of said substrate or in a direction different from a major-axis direction and/or a minor-axis direction of a laser-beam irradiated region at the time of application of said laser annealing.

15 ~~17. The liquid crystal display device according to claim 15 wherein~~

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among said plurality of second thin-film transistors,
said some or all of second thin-film transistors in which the channel width direction is formed non-parallel with and non-orthogonal to the channel width direction of said first thin-film transistors

20 are used, in said display drive circuit, as sampling transistors for sampling video signals at a predetermined timing and supplying said display signals to the corresponding
25 plurality of first thin-film transistors.

18. The liquid crystal display device according to claim 15 wherein

~~said display drive circuit comprises:~~

a video signal line to which the video signals are supplied from outside, sampling transistors for sampling the video signals from said video signal line at a predetermined timing and supplying said display signals to the corresponding plurality of first thin-film transistors, and a shift register for controlling switching operation of said sampling transistors,

and wherein, among said plurality of second thin-film transistors, said some or all of second thin-film transistors in which the channel width direction is formed non-parallel with and non-orthogonal to the channel width direction of said first thin-film transistors

are used in said sampling transistors and the shift register.

19. The liquid crystal display device according to claim 15 wherein

said laser annealing is performed to poly-crystallize an amorphous semiconductor film and obtain a polycrystalline semiconductor film.

20. ~~The liquid crystal display device according to claim 15~~ wherein

said channel width direction of the channel region of said some or all of second thin-film transistors is set to a direction of about 45° relative to the channel width direction of said first thin-film transistors.

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